

REMARKS

Claims 1 and 3-21 are pending in the present application. In the Office Action mailed May 27, 2010, the Examiner rejected claims 1 and 3-5 under 35 U.S.C. §112, first paragraph, because the specification, while being enabling for a center region being sampled after a periphery region, does not reasonably provide enablement for a center region being sampled after a center region. The Examiner next rejected claims 1, 4, 5, and 6-21 under 35 U.S.C. §112, first paragraph, because the specification, while being enabling for increasing the predetermined amount of time as the peripheral region distance from the center region of k-space increases, does not reasonably provide enablement for decreasing the predetermined amount of time as the peripheral region distance from the center region of k-space increases. Claims 9 and 11 were rejected under 35 U.S.C. §112, first paragraph, because the specification, while being enabling for a delay time to increase as the periphery region increases in distance from the center region, does not reasonably provide enablement for the periphery region decreasing in distance from the center while the time delay increases. Claims 12 and 18 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claims 1 and 3-21 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 6-21 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. Claims 1 and 3-5 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. Claims 1 and 3 were rejected under 35 U.S.C. §102(b) as being anticipated by Ookawa (US Pub. 2001/0004211).

Claims 6-13 are objected to by the Examiner.

Rejections under 35 USC §112, first paragraph**Claim 1**

The Examiner rejected claim 1 under 35 U.S.C. §112, first paragraph, generally asserting that the specification does not enable claim 1 because “sequences other than those disclosed [in the specification] can read on the claim language.” See *Office Action*, May 27, 2010, p. 2-3. While Applicant disagrees with the Examiner’s rationale for issuing the rejection under 35 U.S.C. §112, first paragraph, Applicant has nonetheless elected to amend claim 1 to further clarify what is called for therein. As amended, claim 1 calls for a method of MR data acquisition including interleaving sampling of peripheral regions of k-space and samplings of a center region of k-

space, wherein performing the interleaved sampling further includes sampling a first peripheral region of k-space at a pre-selected temporal rate, waiting a first predetermined period of time before sampling the center region of k-space at a faster temporal rate than the first peripheral region, sampling a second peripheral region of k-space at the pre-selected temporal rate, and waiting a second predetermined period of time different than the first predetermined period of time before sampling the center region of k-space at a faster temporal rate than the second peripheral region, with the first and second predetermined periods of time being a function of a distance of the respective first and second peripheral regions from the center region of k-space.

In rejecting claim 1 under 35 U.S.C. §112, first paragraph, the Examiner further stated that the Specification “does not reasonably provide enablement for decreasing the predetermined amount of time as the peripheral region distance from the center region of k-space increases.” *Office Action*, supra at 3. Again, Applicant believes that such a statement does not provide a proper basis for a rejection under 35 U.S.C. §112, first paragraph. That is, Applicant nowhere claims a method where the predetermined amount of time is decreased as the peripheral region distance from the center region of k-space is increased. In effect, the Examiner is asserting that the specification fails to enable an element that is not even called for in the present claim, and thus the rejection is clearly erroneous. As called for in claim 1, the method provides for waiting a predetermined period of time before sampling the center region of k-space after sampling of a peripheral region, with the predetermined period of time being a function of a distance of the sampled peripheral region from the center region of k-space. The Specification enables claim 1 by setting forth that the length of delay before sampling the center of k-space increases as the distance from the center of k-space of an immediately preceding sampled region of k-space increases. *Specification*, p. 10, lns. 19-29. As such, that which is called for in claim 1 is properly enabled by the Specification.

In light of the amendment to claim 1 and the arguments set forth above, Applicant respectfully requests that the Examiner withdraw the rejection of claim 1 under 35 U.S.C. §112, first paragraph.

Claim 6

The Examiner rejected claim 6 under 35 U.S.C. §112, first paragraph, again stating that the Specification “does not reasonably provide enablement for decreasing the predetermined amount of time as the peripheral region distance from the center region of k-space increases.” *Office Action*, supra at 3. As set forth above with respect to claim 1, Applicant believes that such a statement does not provide a proper basis for a rejection under 35 U.S.C. §112, first paragraph,

as the Examiner is in effect asserting that the specification fails to enable an element that is not even called for in the present claim. That is, claim 6 does not call for a predetermined amount of wait time to be decreased as the peripheral region distance from the center region of k-space is increased.

While Applicant believes that the rejection of claim 6 under U.S.C. §112, first paragraph, is in error, Applicant has nonetheless elected to amend claim 6 to further clarify what is called for therein. As amended, claim 6 calls for, in part, an MRI apparatus that includes a computer programmed to segment k-space into a center region and a number of peripheral regions, determine a distance of each peripheral region from the center region, sample an MR signal so as to fill each of the number of peripheral regions, and sample an MR signal, subsequent to each sampling of a respective peripheral region, so as to fill the center region, wherein each sampling of the MR signal to fill the center region is delayed as a function of the distance of an immediately preceding sampled peripheral region from the center region.

In light of the amendment to claim 6 and the arguments set forth above, Applicant respectfully requests that the Examiner withdraw the rejection of claim 6 under 35 U.S.C. §112, first paragraph.

Claim 14

The Examiner rejected claim 14 under 35 U.S.C. §112, first paragraph. In rejecting the claim, the Examiner employed the same rationale as used for claims 1 and 6, again stating that the Specification “does not reasonably provide enablement for decreasing the predetermined amount of time as the peripheral region distance from the center region of k-space increases.” *Office Action*, supra at 3. As set forth above with respect to each of claims 1 and 6, Applicant believes that such a statement does not provide a proper basis for a rejection under 35 U.S.C. §112, first paragraph, as the Examiner is in effect asserting that the specification fails to enable an element that is not even called for in the present claim. That is, claim 14 does not call for a predetermined amount of wait time to be decreased as the peripheral region distance from the center region of k-space is increased.

Applicant has nonetheless amended claim 14 to further clarify what is called for therein. As amended, claim 14 calls for, in part, a computer readable storage medium including a set of instructions that when executed by a processor causes the processor to partition k-space into a plurality of partitions wherein one partition corresponds to a center of k-space and the other partitions correspond to peripheral regions of k-space, determine a distance from the center of k-space for each peripheral region, sample a peripheral region, and subsequent to sampling of the

peripheral region, delay the sampling of the center k-space by a predetermined value that is a function of the distance of the immediately preceding sampled peripheral region from the center of k-space.

In light of the amendment to claim 14 and the arguments set forth above, Applicant respectfully requests that the Examiner withdraw the rejection of claim 14 under 35 U.S.C. §112, first paragraph.

Claims 9, 11, 12, and 18

The Examiner rejected each of claims 9, 11, 12, and 18 under 35 U.S.C. §112, first paragraph. Responsive thereto, Applicant has amended claims 9, 12, and 18 in order to further define the scope of the claims. Claim 11 has been canceled

In light of the amendments, Applicant respectfully requests that the Examiner withdraw the rejection of claims 9, 12, and 18 under 35 U.S.C. §112, first paragraph.

Rejections under 35 USC §112, second paragraph

The Examiner rejected each of claims 1, 6, and 14 under 35 U.S.C. §112, second paragraph. In rejecting the claims, the Examiner stated that the claims are “incomplete for omitting essential elements, such omission amounting to a gap between the elements,” and set forth a number of elements omitted from claims 1, 6, and 14 that were asserted to be “essential.” *See Office Action*, supra at 5 and 6. As explained in detail below, Applicant respectfully disagrees with the rejection and believes the rejection to be improper.

MPEP §2172.01 limits when an element/limitation can be considered an “essential element,” setting forth that “[a] claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected under 35 U.S.C. 112, first paragraph, as not enabling.” *MPEP §2172.01*. The Examiner, however, relied on 35 U.S.C. §112, second paragraph, to reject claims 1, 6, and 14. As such, the Examiner’s basis for rejection is improper.

Further, according to MPEP §2172, “[a] rejection based on the failure to satisfy this requirement is appropriate only where applicant has stated, somewhere other than in the application as filed, that the invention is something different from what is defined by the claims.” The Examiner has not pointed to any language wherein Applicant has stated that specific elements identified by the Examiner as being omitted from the claims are essential elements/steps to the invention as claimed. The Examiner is not at liberty to declare elements as “essential” without some indication by Applicant that the element is so critical as being required for

enablement. Since Applicant has not made any such statements, a rejection of claims 1, 6, and 14 under MPEP §2172.01 based on the omission of essential steps is improper.

For at least this reason, Applicant believes that the rejection of claims 1, 6, and 14 under 35 U.S.C. §112, second paragraph, is improper and respectfully requests withdrawal thereof.

Rejection under 35 USC §102(b)

The Examiner rejected claims 1 and 3 under 35 USC §102(b) as being anticipated by Ookawa (US Pub. 2001/0004211). With respect to claim 1, and as set forth above, Applicant has amended claim 1 to further clarify what is called for therein, without acquiescing to the rejection under 35 USC §102(b). As amended, claim 1 calls for a method of MR data acquisition including interleaving sampling of peripheral regions of k-space and samplings of a center region of k-space, wherein performing the interleaved sampling further includes sampling a first peripheral region of k-space at a pre-selected temporal rate, waiting a first predetermined period of time before sampling the center region of k-space at a faster temporal rate than the first peripheral region, sampling a second peripheral region of k-space at the pre-selected temporal rate, and waiting a second predetermined period of time different than the first predetermined period of time before sampling the center region of k-space at a faster temporal rate than the second peripheral region, with the first and second predetermined periods of time being a function of a distance of the respective first and second peripheral regions from the center region of k-space.

Applicant believes that Ookawa fails to teach that which is called for in claim 1. Specifically, Ookawa fails to teach a method of MR data acquisition including interleaving sampling of peripheral regions of k-space and samplings of a center region of k-space, where first and second predetermined periods of waiting time are instituted prior to sampling the center region of k-space that are a function of a distance of previously sampled respective first and second peripheral regions from the center region of k-space.

With respect to Ookawa, an MR pulse sequence is disclosed that includes a plurality of pre-pulses and flip pulses, where the pre-pulse application frequency with respect to the flip-pulse is decreased outward from zero encode in the k-space, and no pre-pulse is applied in the outermost region. *Ookawa*, ¶[0031]. That is, the pre-pulse application frequency with respect to the flip-pulse is changed every period on a photographing time axis, thereby providing for a shortened photographing time compared to a case wherein one pre-pulse is applied for one flip-pulse uniformly in all the regions of the k-space. *Ookawa*, ¶[0031]. There is no teaching in Ookawa, however, of interleaving sampling of peripheral regions of k-space and samplings of a

center region of k-space, nor is there any teaching of first and second predetermined periods of waiting time being instituted prior to sampling the center region of k-space that are a function of a distance of previously sampled respective first and second peripheral regions from the center region of k-space.

In light of at least the above, Applicant believes that claim 1 and the claims dependent therefrom are patentably distinct from Ookawa.

In addition to the above amendments and Remarks, Applicant has amended claims 16, 17, and 20.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1, 3-10, and 12-21.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-0845. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-0845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 07-0845. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 07-0845.

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